CLAIMS

The following is claimed:

1. A system for automatically reducing noise for video encoding, comprising:

a video input module, wherein said video input module comprises:

logic to filter noise from currently received video data;

logic to combine said filtered data, wherein said combining is dependent upon a category of said noise; and,

logic to provide a weighted average of a current field derived from said combined data and a prior field, wherein said prior field is derived from previously combined data that has been previously stored, said weighted average being determined by pixel motion between said current field and said prior field; and,

a motion estimation unit, wherein said motion estimation unit comprises:

logic to separate a current video frame into multiple current regions of pixels and separate a prior video frame into multiple reference regions of pixels, wherein said prior video frame is derived from said previously stored data; and

logic to determine a first reference region within said multiple reference regions of pixels that is most like a selected current region within said multiple current regions of pixels, said determination being utilized to determine said noise.

2. A system for automatically reducing noise for video encoding, comprising:

a video input module configured perform the steps of:

filtering noise from currently received video data;

combining said filtered data, wherein said combining step is dependent upon a category of said noise;

providing a weighted average of a current field derived from said combined data and a prior field, wherein said prior field is derived from previously combined data that has been previously stored, said weighted average being determined by pixel motion between said current field and said prior field; and

a motion estimation unit that is capable of performing the steps of:

separating a current video frame into multiple current regions of pixels and separating a prior video frame into multiple reference regions of pixels, wherein said prior video frame is derived from said previously stored data; and

determining a first reference region within said multiple reference regions of pixels that is most like a selected current region within said multiple current regions of pixels, said determination being utilized to determine said noise.

3. The system of claim 2, wherein said video input module further performs the step of, dynamically changing the value of said weighted average in accordance with each new current field, each new current field being attributed to newly received video data.

4. The system of claim 2, wherein said current and prior fields are provided to said video input module in a numerical representation that represents brightness and color of pixels within said current and prior fields.

5. The system of claim 2, further comprising an encoder unit for encoding said video data after reducing said noise.

6. The system of claim 2, wherein a high pixel motion results in said weighted average being weighed more toward said current field as opposed to said prior field.

7. The system of claim 2, wherein a low pixel motion results in said weighted average being weighed more toward said prior field.

8. The system of claim 2, wherein said step of determining said first reference region within said multiple reference regions of pixels that is most like said selected current region within said multiple current regions of pixels is performed by comparing pixel luma values.

9. The system of claim 2, wherein, if said video data comprises a large amount of video motion, said video input module further performs the steps of:

determining said amount of video motion; and

modifying said weighted average to compensate for said motion.

10. The system of claim 9, wherein, to perform said step of determining said amount of video motion, said video input module further performs the steps of:

determining a sum of absolute pixel differences between said current field and said prior field; and

determining a maximum sum of absolute differences between said current field and said prior field over a zone, wherein said zone is a rectangular region of said frame.

11. The system of claim 2, wherein said motion estimation unit further performs the step of, determining a sum of absolute pixel differences between said selected current region and said determined first reference region.

12. The system of claim 11, wherein said motion estimation unit performs said step of determining said sum multiple times in accordance with newly received video data utilizing a different current region / reference region pair, and determining a lowest sum from said sum determinations, wherein said current region / reference region pair associated with said lowest sum is utilized to determine said noise.

13. A system for automatically reducing noise for video encoding, comprising:

means for filtering noise from currently received video data;

means for combining said filtered data, wherein said combining is dependent upon a category of said noise;

means for providing a weighted average of a current field derived from said combined data and a prior field, wherein said prior field is derived from previously

combined data that has been previously stored, said weighted average being determined by pixel motion between said current field and said prior field;

means for separating a current video frame into multiple current regions of pixels and separating a prior video frame into multiple reference regions of pixels, wherein said prior video frame is derived from said previously stored data; and

means for determining a first reference region within said multiple reference regions of pixels that is most like a selected current region within said multiple current regions of pixels, said determination being utilized to determine said noise.

14. The system of claim 13, further comprising:

means for encoding said video data after reducing said noise.

15. The system of claim 13, further comprising:

means for dynamically changing the value of said weighted average in accordance with each new current field, each new current field being attributed to newly received video data.

16. The system of claim 13, wherein said current and prior fields are provided in a numerical representation that represents brightness and color of pixels within said current and prior field.

17. The system of claim 13, wherein said noise is selected from the group consisting of impulsive noise and high frequency noise.

18. The system of claim 13, wherein a high pixel motion results in said weighted average being weighed more toward said current field as opposed to said prior field.

19. The system of claim 13, wherein a low pixel motion results in said weighted average being weighed more toward said prior field.

20. The system of claim 13, wherein said means for determining said first reference region within said multiple reference regions of pixels that is most like said selected current region within said multiple current regions of pixels performs said determination by comparing pixel luma values.

21. The system of claim 13, wherein said system further comprises:

means for determining said amount of video motion; and

means for modifying said weighted average to compensate for said motion, wherein said means for determining said amount of video motion and said means for modifying are utilized if said video data comprises a large amount of video motion.

22. The system of claim 21, further comprising:

means for determining a sum of absolute pixel differences between said current field and said prior field; and

means for determining a maximum sum of absolute differences between said current field and said prior field over a zone, wherein said zone is a rectangular region of said frame.

23. The system of claim 13, further comprising:

means for determining a sum of absolute pixel differences between said selected current region and said determined first reference region.

24. The system of claim 23, wherein said step of determining said sum is performed multiple times in accordance with newly received video data utilizing a different current region / reference region pair, and wherein said system further comprises means for determining a lowest sum from said sum determinations, wherein said current region / reference region pair associated with said lowest sum is utilized to determine said noise.

25. A method of automatically reducing noise for video encoding, comprising the steps of:

filtering noise from currently received video data;

combining said filtered data, wherein said combining step is dependent upon a category of said noise;

providing a weighted average of a current field derived from said combined data and a prior field, wherein said prior field is derived from previously combined data that has

been previously stored, said weighted average being determined by pixel motion between said current field and said prior field;

separating a current video frame into multiple current regions of pixels and separating a prior video frame into multiple reference regions of pixels, wherein said prior video frame is derived from said previously stored data; and

determining a first reference region within said multiple reference regions of pixels that is most like a selected current region within said multiple current regions of pixels, said determination being utilized to determine said noise.

26. The method of claim 25, further comprising the step of encoding said video data after reducing said noise.

27. The method of claim 25, further comprising the step of dynamically changing the value of said weighted average in accordance with each new current field, each new current field being attributed to newly received video data.

28. The method of claim 25, wherein said current and prior fields are provided in a numerical representation that represents brightness and color of pixels within said current and prior field.

29. The method of claim 25, wherein said noise is selected from the group consisting of impulsive noise and high frequency noise.

30. The method of claim 25, wherein a high pixel motion results in said weighted average being weighed more toward said current field as opposed to said prior field.

31. The method of claim 25, wherein a low pixel motion results in said weighted average being weighed more toward said prior field.

32. The method of claim 25, wherein said step of determining said first reference region within said multiple reference regions of pixels that is most like said selected current region within said multiple current regions of pixels is performed by comparing pixel luma values.

33. The method of claim 25, wherein, if said video data comprises a large amount of video motion, further performing said steps of:

determining said amount of video motion; and

modifying said weighted average to compensate for said motion.

34. The method of claim 33, further comprising the steps of:

determining a sum of absolute pixel differences between said current field and said prior field; and

determining a maximum sum of absolute differences between said current field and said prior field over a zone, wherein said zone is a rectangular region of said frame.

35. The method of claim 25, further comprising the step of:

determining a sum of absolute pixel differences between said selected current region and said determined first reference region.

36. The method of claim 35, wherein said step of determining said sum is performed multiple times in accordance with newly received video data utilizing a different current region / reference region pair, and wherein said method further comprises the step of determining a lowest sum from said sum determinations, wherein said current region / reference region pair associated with said lowest sum is utilized to determine said noise.